

**REMARKS**

With the entry of the present amendments, claims 1-22 and 24-36 are pending in the application. Claims 1-17 have been allowed. Claim 23 has been cancelled. Claims 18, 20, 27 and 28 have been amended. New claims 32-36 have been added. Claim 18 has been amended to include the limitations of original dependent claims 23 and 25 and claim 20 and has been rewritten in independent form to include all of the limitations from original claim 18. Claims 27 and 28 have been amended to revise their claim dependencies. Support for the new claims may be found in paragraphs 24 and 28 of the application.

In view of the following remarks, reconsideration and withdrawal of the rejections to the application in the Office Action is respectfully requested.

***I. REJECTION OF CLAIMS 18-19, 21, 23-26 and 29-31 UNDER 35 USC § 102(b)***

In the Office Action, claims 18-19, 21, 23-26 and 29-31 were rejected under 35 USC § 102(b) as anticipated by U.S. Patent No. 2,697,028, issued to Baker et al., hereinafter “Baker.” In support of this rejection, the Examiner stated, “because the product’s surface would have the same structure as that claimed by the applicant, it is the examiner’s position that the films would inherently possess the applicant’s claimed hardness properties.” Applicants respectfully traverse.

In order to establish a prima facie case of anticipation, a cited reference must teach each and every element, either expressly or inherently, of the rejected claim. (MPEP 2131) The carbon films taught by Baker do not have the same structure as the surface films of the present invention and, therefore, it is not true that they would inherently possess the same hardness properties, as asserted by the Examiner. The carbon films of Baker are formed by the high temperature pyrolysis of hydrocarbons. After pyrolysis, “the carbon network of the original hydrocarbons has undergone substantial rearrangement to the aromatic or graphitic configuration.” (See col. 10, lines 8.) The resulting structure is characterized by graphitic layers with crosslinks between the graphitic planes. (See col. 10, lines 10-48.) In contrast, the hydrocarbons used in the methods of the present application do not undergo pyrolysis and, therefore, do not undergo rearrangement to a graphitic configuration to form the surface films.

Instead the surface films of the present application provide a crosslinked network of (non-graphitic) carbon chains. It is this unique structure that provides the surface films of the present application with the claimed hardness properties. These structures and their inherent hardness properties cannot be achieved in carbon films made with the pyrolysis methods of Baker. Thus, the Examiner's assertion that the carbon films of Baker would inherently possess the same structure and, therefore, the same hardness properties, as those of the present invention is not supported by the teaching of Baker.

Because Baker fails to teach a carbon film having the hardness properties recited in Claim 1, Baker does not teach every limitation of that claim, either explicitly or inherently and Applicants respectfully request that this rejection be withdrawn.

## **II. REJECTION OF CLAIMS 18-25 and 27-31 UNDER 35 USC § 102(b)**

In the Office Action, claims 18-25 and 27-31 were rejected under 35 USC 102(b) as anticipated by U.S. Patent No. 5,643,343, issued to Selifanov et al., hereinafter "Selifanov." In support of this rejection, the Examiner again stated, "because the product's surface would have the same structure as that claimed by the applicant, it is the examiner's position that the films would inherently possess the applicant's claimed hardness properties." Applicants respectfully traverse.

The abrasive materials of Selifanov do not provide a cross-linked network of carbon chains as recited in the pending claims. It follows that the abrasive materials taught by Selifanov do not have the same structure as the surface films of the present application. Therefore, contrary to the Examiner's assertion, it is not true that the two films would inherently possess the same hardness properties.

Selifanov teaches a vacuum condensate that is "an *ultradispersed* (superdispersed) *composite* superhard diamond-like substance" that may be adhered to a plastic carrier. (See col. 4, lines 21-31; emphasis added.) However, Selifanov describes this vacuum condensate as a composite of superfine crystallites dispersed in a quasi-amorphous phase, such as a carbonaceous matrix. (See, for example, col. 5, lines 52-57.) Thus, it is clear from the description in Selifanov that the abrasive materials taught therein are composite materials made from dispersed

crystallites. Such a structure is very different from the cross-linked network of carbon chains recited in the pending claims. Indeed, nowhere in the reference does Selifanov describe the abrasive materials taught therein as cross-linked. The Examiner finds support for crosslinking in the teaching that the material of Selifanov preferably has a prevalence of  $sp^3$  bonds. (Col. 6, lines 21-63.) Applicants respectfully point out that, as noted by Selifanov,  $sp^3$  bonds are typical of diamonds. Therefore, the prevalence of  $sp^3$  bonds is consistent with a structure (such as that described in Selifanov) that contains dispersed diamond-like crystallites and does not provide proof of a crosslinked network of carbon chains. As discussed in paragraph 28 of the present specification, structures of the type described by Selifanov (i.e., crystalline domains embedded in amorphous domains) do not provide the hardness properties recited in amended claim 18.

Because the abrasive materials of Selifanov are not cross-linked networks of carbon chains having the hardness properties recited in amended claim 18, that claim is not anticipated by Selifanov and Applicants respectfully request that this rejection be withdrawn.

With regard to amended claim 20, Applicants further note that Selifanov does not teach a surface film integrated into a polymeric substrate. As clearly described in paragraph 30 of the present specification, an integrated film is characterized by “partially converted polymer chains which bridge the interface between the hard carbon films and the underlying substrate.”

Although the abrasive materials of Selifanov may be chemically bonded to a plastic carrier, there is no teaching in Selifanov that the abrasive materials may be “integrated into” the plastic carrier, as that term is defined in the present application. For this additional reason, Applicants respectfully request that this rejection be withdrawn.

### ***III. REJECTION OF CLAIMS 18, 19, 22-27, 29 and 31 UNDER 35 USC 102(b)***

In the Office Action, claims 18, 19, 22-27, 29 and 31 were rejected under 35 USC 102(b) as anticipated by U.S. Patent No. 6,265,068, issued to David et al., hereinafter “David.” In support of this rejection the Examiner again stated, “because the product’s surface would have the same structure as that claimed by the applicant, it is the examiner’s position that the films would inherently possess the applicant’s claimed hardness properties.” Applicants respectfully traverse.

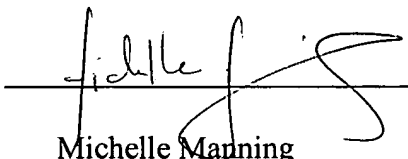
The carbon films of David do not have the same structure as the surface films of the present application and, therefore, the carbon films of David would not inherently possess the same hardness properties. The method used to produce the structures of David inherently produces structures that differ from those of the surface films of the present invention. The films of David are made using standard plasma deposition techniques with low molecular weight hydrocarbon precursor molecules. (See col. 6, lines 42-46 and col. 8, lines 12-18.) The resulting films are very different from the surface films of the present application which are made from polymers. This distinction is discussed in paragraph 28 of the pending specification. As such, the diamond-like carbon films of David do not have the hardness properties recited in amended claim 18 and claim 25. In fact, this is acknowledged in the Examples of David which report that the diamond-like coatings of David were found to have Mohs hardness of 7 to 8. (See col. 15, lines 49-55.) *This is substantially lower than the Mohs hardness of at least 9 recited in pending claims 18 and 25.* Therefore, because the films of David do not inherently possess the hardness properties recited in the rejected claims, as amended, Applicants respectfully request that this rejection be withdrawn.

In view of the foregoing remarks, Applicants respectfully submit that all of the claims remaining in the application are in condition for allowance and favorable action thereon is respectfully solicited.

Respectfully submitted,

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